

WHAT IS CLAIMED IS:

1. A microelectronic assembly comprising:
  - (a) first and second microelectronic elements; and
  - (b) a plurality of composite conductive elements, each said composite conductive element including a core and a layer of a conductive material surrounding the core, said conductive material having a melting temperature less than about 150°C, said cores having a melting temperature higher than said conductive material, said conductive elements being disposed between said microelectronic elements and connecting said microelectronic elements to one another.
2. An assembly as claimed in claim 1 wherein said melting temperature conductive material of said conductive material is less than about 85°C.
3. An assembly as claimed in claim 1 wherein said microelectronic elements have a normal operating temperature range and wherein said melting temperature of said conductive material is within or below said normal operating temperature range.
4. An assembly as claimed in claim 1 wherein said layer of conductive material in each said conductive element is about 50  $\mu\text{m}$  or less.
5. An assembly as claimed in claim 1 wherein each said core is spherical.
6. An assembly as claimed in claim 1 wherein each said core is hollow.
7. An assembly as claimed in claim 1 wherein each said core is solid throughout.
8. An assembly as claimed in claim 1 wherein said cores are substantially rigid.
9. An assembly as claimed in claim 1 wherein said cores are compliant.
10. An assembly as claimed in claim 1 wherein said second microelectronic element includes a flexible film having a first surface facing in a first vertical direction toward said first microelectronic element and having a second surface

facing in a second vertical direction away from said first microelectronic element.

11. An assembly as claimed in claim 10 wherein said second microelectronic element has contacts on said second surface offset from said conductive elements in one or more lateral directions transverse to said vertical directions.

12. An assembly as claimed in claim 11 wherein said second microelectronic element has contacts on said first surface electrically connected to said contacts on said second surface and wherein said first microelectronic element includes one or more semiconductor chips having contacts on a front face, said conductive elements electrically connecting said contacts on said front face of said one or more semiconductor chips to said contacts on said first face of said second microelectronic element.

13. An assembly as claimed in claim 12 further comprising a compliant dielectric material disposed between said first and second elements and surrounding said conductive elements.

14. An assembly as claimed in claim 10 wherein said second microelectronic element has contacts on said first and second surfaces electrically connected to one another, and wherein said first microelectronic element includes one or more semiconductor chips having contacts on a front face, said conductive elements electrically connecting said contacts on said front face of said one or more semiconductor chips to said contacts on said first face of said second microelectronic element.

15. An assembly as claimed in claim 13 further comprising a compliant dielectric material disposed between said first and second elements and surrounding said conductive elements.

16. An assembly comprising:

(a) a first microelectronic element having contacts thereon;

(b) a second microelectronic element including a flexible sheet having lateral directions along the sheet and having vertical directions transverse to the sheet, said sheet having first contacts facing toward said first microelectronic element and having second contacts facing away from said microelectronic element, said second contacts being offset from said first contacts in one or more of said lateral directions, at least some of said second contacts being electrically connected to at least some of said first contacts; and

(c) first electrically conductive elements connecting said first contacts to said first microelectronic element, said sheet being vertically spaced from said first microelectronic element so that said sheet is free to flex in said vertical directions, whereby flexural movement of said sheet can accommodate movement of said second contacts relative to said first microelectronic element.

17. An assembly as claimed in claim 16 wherein said first electrically conductive elements support said sheet away from said first microelectronic element.

18. An assembly as claimed in claim 17 further comprising a compliant filler disposed between said sheet and said first microelectronic element.

19. An assembly as claimed in claim 17 further comprising a third microelectronic element, said sheet being disposed between said first and third microelectronic elements, the assembly further comprising second conductive elements electrically connecting said second contacts and said third microelectronic element.

20. A conductive element including a spherical core and a layer of a conductive material on said core, said conductive material having a melting temperature less than about 150°C, said core having a melting temperature above the melting temperature of said conductive material.

21. A conductive element as claimed in claim 20 wherein said layer of conductive material is less than about 50 microns thick.

22. A conductive element as claimed in claim 20 wherein said core is hollow.

23. A conductive element as claimed in claim 20 wherein said core is solid throughout.

24. A conductive element as claimed in claim 20 wherein said core and said conductive material are metallic.